HFAT Phase 5
DRDC-Toronto

Test Report

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Revisions

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Abstract

This report describes the software development and testing completed for the Human Factors Analysis Tools (HFAT). This development increased the capabilities of HFAT to support human factors engineering information collection and modelling. The HFAT user's guide should be consulted for a complete description of the HFAT capabilities as this report only describes current contract work done.

Résumé

Le présent rapport décrit le processus d'élaboration et d'essai du logiciel d'analyse des facteurs humains *Human Factors Analysis Tools* (HFAT). Ce travail a permis d'accroître la capacité du logiciel HFAT en vue de la collecte de données ergonomiques et de la modélisation. Pour une description complète de la capacité du logiciel HEAT, il faudra consulter le guide de l'usager, puisque ce rapport ne décrit que le travail réalisé dans le cadre du présent contrat.

Executive Summary

DRDC Toronto is developing software tools to support Human Factors Engineering (HFE). The software is being designed and written by Micro Analysis and Design of Colorado comprises two packages: the Human Factors Analysis Tools (HFAT, although it will be called HAWK in the future) and IPME (Integrated Performance Modelling Environment). IPME is a relatively mature, computational modelling software for representing human behaviour; it is not a convenient environment for analysts, project managers, or desk officers to collect or manage human factors data. HFAT (HAWK) is being developed to support the data collection, management, and archiving required to support human modelling; ultimately, it will also provide preliminary model development, although it will not provide computational execution capabilities.

HFAT and IPME are being developed as compatible, integrated products, however, each may be used independent of the other. Further, HFAT could serve as a data collection tool for other human behaviour modelling environments that use task network simulations of behaviour, with the development of suitable data-exchange software. When complete, HFAT will provide tools to support a broad range of HFE analysis tasks as outlined in the US DOD Mil Handbook 46855A, providing the Canadian Forces with the means to collect and manage human behavioural data in support of Simulation and Modelling for Acquisition, Rehearsal and Training (SMART) activities.

Sommaire administratif

RDDC Toronto développe actuellement un logiciel dans le but de favoriser l'ergonomie. Le logiciel, conçu et écrit par Micro Analysis and Design du Colorado, se compose de deux prologiels : *Human Factors Analysis Tools* (HFAT, bien qu'il se nommera HAWK à l'avenir) et *Integrated Performance Modelling Environment* (IPME). IPME est un logiciel de modélisation computationnelle, relativement au point, qui permet de représenter le comportement humain. Cependant, ce n'est pas un environnement qui convient aux analystes, aux gestionnaires de projet ou aux agents de bureau pour la collecte ou la gestion des données ergonomiques. C'est le logiciel HFAT (HAWK), en cours d'élaboration, qui servira à recueillir, gérer et archiver les données nécessaires à la modélisation humaine. À la fin du processus, ce logiciel offrira aussi le développement de modèles préliminaires, même s'il ne procure pas de capacité d'exécution computationnelle.

Les logiciels HFAT et IPME ont été conçus pour être compatibles et intégrés. Pourtant, chacun d'eux peut être utilisé indépendamment de l'autre. En outre, le développement d'un logiciel adapté d'échange de données permettrait d'utiliser HFAT comme outil de collecte de données pour d'autres environnements de modélisation du comportement humain qui simulent ce dernier au moyen d'un réseau de tâches. Quand le logiciel HFAT sera achevé, il fournira les moyens d'accomplir un large éventail de tâches aux fins d'analyses ergonomiques, tel qu'indiqué dans livret US DOD Mil Handbook 46855A. Les Forces canadiennes auront ainsi les outils nécessaires pour recueillir et gérer des données sur le comportement humain et pour mener des activités de simulation et de modélisation en vue de l'acquisition, les essais et l'instruction (SMART).

1 Introduction

1.1 Goals

This contract involved the following tasks:

- Adding projects to HFAT

The addition of projects to HFAT requires that the functionality that previously existed remain, and that the new elements work correctly with existing elements. Specifically, projects, multiple systems within projects, and unassigned models have been added to HFAT. Each of these elements must be tested. Additionally, loading from and saving to both remote and local databases, importing and exporting data using XML, and the display and alteration of data must be tested. Functions at each level (Project, System, Model, Document Manager) must be tested and ensured to work correctly.

- Implementing database versioning for HFAT

Database versioning has been added to HFAT. This functionality is similar to IPME's database versioning. HFAT retrieves the correct database name based on its version. If the database does not exist, HFAT creates the database.

- Adding printing functionality

HFAT now has the capability to print project, system, and model data through the interface. The data is printed to an HTML file.

- Task Notes Modifications

When the task notes window is opened in both IPME and HFAT, the General Note is the default data displayed. The displayed note should not change from task to task.

- OSD Modifications

The user can now select time intervals to view in the OSD Viewer. Additionally, the user can select colours for critical, important, or routine tasks. The colour ranges are defined in the OSD Viewer. The OSD Viewer also shows the user either actual or mean time. This change solves the problem with false loopbacks appearing in the OSD Viewer.

1.2 Assumptions

It is assumed that the person performing the tests is familiar with this document and with the general functions of HFAT and IPME, and knows how to perform actions such as determining whether an item is stored in the (local or remote) database, how to check for the existence and validity of an XML file, and so forth.

1.3 Risks and Assets

In order to test, machines with all the relevant operating systems must be available to have HFAT Phase 5 installed on them.

1.4 Terms

HFAT – Human Factors Analysis Tools
IPME – Integrated Modelling Performance Environment
Dirty Dot – A small circle (dot) next to the names in the tree display that mark an item as needing to be saved.

1.5 References

HFAT Phase 5 Requirements Specification.

2 Features To Be Tested

2.1 HFAT Phase 5 Visual Elements

2.1.1 Menus

2.1.1.1 File Menu

The File menu in HFAT should contain specific elements spelled correctly. There are elements that are included when debugging that should not be included in the final distribution.

Testing Procedure

1. Open HFAT
2. Click on the File menu
3. Verify that Import exists. Additionally, the Import menu should contain selections for Project, System, Crew Model, Task Network Model, and Documents.
4. Verify that Export exists. Additionally, the Export menu should contain selections for Project, System, Crew Model, Task Network Model, and Documents.
5. Verify there is a separator between Export and the following menu item.
6. Verify that Print Options... exists.
7. Verify there is a separator between Print Options... and the following menu item.
8. Verify that Print Project To File exists.
9. Verify that New Project exists.
10. Verify that Delete Project exists.
11. Verify there is a separator between Delete Project and the following menu item.
12. Verify that Exit exists.
13. No other menu items should be present.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.1.1.2 Database Menu

This Database menu in HFAT should contain specific elements spelled correctly. There are elements that are included when debugging that should not be included in the final distribution.

Testing Procedure

1. Open HFAT.
2. Click on the Database menu.

3. Verify that Local exists. Additionally, the Local menu should contain selections for Load from Local Database and Save to Local Database.
4. Verify that Remote exists. Additionally, the Remote menu should contain selections for Connect to Database, Disconnect from Database, Load from Remote Database, and Save to Remote Database. Only Connect to Database should initially be enabled (not gray). All other menu items should be gray.
5. No other menu items should be present.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.1.2 Project Elements

2.1.2.1 Main Screen

The main portion of the HFAT screen should contain the display area for the projects, systems and models that have been loaded. Additionally, when no project, system or model has yet been loaded, the main screen should contain a default project and system.

Testing Procedure

1. Open HFAT
2. Verify that a project exists with the name "HFAT_Project". Additionally, the project should be in the "unexpanded" state.
3. Expand the project. Verify that a system with the name "System1" exists. Additionally, verify that both the project and the system are marked as unsaved by a "dirty dot."

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.1.2.2 Right Click Menu

The projects in HFAT should have a menu accessible from a right mouse click. This menu should contain specific items spelled correctly. There are elements that are included when debugging that should not be included in the final distribution.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.

3. Verify that a menu pops up. Additionally the menu should contain selections for Rename Project, Add System, Add Model, Document Manager, Save To Database, Export Project, Print Project To File, Clear Project, and Copy Project.
4. The Add Model item should contain selections for Crew Model and Task Network Model
5. The Save to Database item should contain selections for Local and Remote. Additionally, Remote should initially be disabled (gray).

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.1.3 System Elements

2.1.3.1 Right Click Menu

The systems in HFAT should have a menu accessible from a right mouse click. This menu should contain specific items spelled correctly. There are elements that are included when debugging that should not be included in the final distribution.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Verify that a menu pops up. Additionally the menu should contain selections for Rename System, System Checklist, Add Model, Save To Database, Export System, Print System To File, Clear System, Copy System and Delete System.
5. The Add Model item should contain selections for Crew Model and Task Network Model
6. The Save to Database item should contain selections for Local and Remote. Additionally, Remote should initially be disabled (gray).

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.1.4 Crew Model Elements

2.1.4.1 Right Click Menu

The crew models in HFAT should have a menu accessible from a right mouse click. This menu should contain specific items spelled correctly. There are elements that are included when debugging that should not be included in the final distribution.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Crew Model entry.
5. Open the "System1" entry
6. Right click on the "CrewModel1" entry.
7. Verify that a menu pops up. Additionally the menu should contain selections for Rename Crew Model, Add Operator, Save To Database, Export Model, Print Model To File, Assign To System, Unassign Model, Copy Model and Delete Model.
8. The Save to Database item should contain selections for Local and Remote. Additionally, Remote should initially be disabled (gray).

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.1.5 Task Network Model Elements

2.1.5.1 Right Click Menu

The task network models in HFAT should have a menu accessible from a right mouse click. This menu should contain specific items spelled correctly. There are elements that are included when debugging that should not be included in the final distribution.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Task Network Model entry.
5. Open the "System1" entry
6. Right click on the "NetModel1" entry.
7. Verify that a menu pops up. Additionally the menu should contain selections for Rename Task Network Model, Edit Task Criticality Definitions, Generate Stability

Analysis Report, Save To Database, Export Model, Print Model To File, Assign To System, Unassign Model, Copy Model and Delete Model.

8. The Generate Stability Analysis Report should initially be disabled (gray).
9. The Save to Database item should contain selections for Local and Remote. Additionally, Remote should initially be disabled (gray).

Test Platform

Windows 2000, RedHat Linux 7.2, Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2 HFAT Phase 5 Functional Elements

2.2.1 Menus

2.2.1.1 File Menu

The File menu in HFAT contains entries for basic import, export, and delete functions. All these functions should work correctly from the menu selection.

Testing Basic Export Function

1. Open HFAT
2. Select File/Export/Project
3. Enter a file name in the file selection dialog
4. Verify that a file with the chosen name was created.

Testing Basic Import Function

1. Open HFAT
2. Open the HFAT_Project item
3. Right click on the System1 item and select Delete System
4. Select File/Import/Project
5. Select the file created in the previous test
6. Verify that no errors occur and that the HFAT_Project again contains System1

Testing Print Options Function

1. Open HFAT
2. Load or import a project containing multiple task network models, each with a few unique Task Notes field names.
3. Select File/Print Options... and verify that the Print Options dialog pops up.
4. Verify that the Project tab is displayed, and that the dialog also has a Crew and a Task Network tab.

5. Select the Task Network tab and verify that the Task Note field check box tree contains only one instance of every note category in the network models in the current project (whether assigned to a system or unsassigned).

Testing Print Project To File Function

1. Open HFAT
2. Load or import a project containing multiple task network models, each with a few unique Task Notes field names.
3. Select File/Print Options... and select the Task Network tab.
4. Check some of the task note fields from the check box tree. (Make sure that some of the tasks in the models in the project contain notes for the fields that are checked.)
5. Click the Accept button and then select File/Print Project To File.
6. Type a file name for the output HTML file, then click the Save button.
7. Open the HTML output file in a web browser and verify that it contains all the data (from the current project) which was specified in the Print Options dialog.

Testing Basic Delete Project Function

1. Open HFAT
2. Select Delete Project
3. Verify that the Delete Project dialog pops up. Additionally, the radio button selection should initially be "Local", the "Connect" button should be disabled (gray), and the project list should be empty.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

PR 282, 283, 284, 285

2.2.1.2 Database Menu

The Database menu in HFAT contains entries for basic load and save functions for both the remote and local databases. All these functions should work correctly from the menu selection.

Testing Basic Local Save and Load

1. Open HFAT
2. Select Local/Load from Local Database. If the project and system are marked with a "dirty dot" (and they should be if you have just opened HFAT), verify that a warning message about data loss pops up. Click OK on the warning dialog. Verify that the Project Selection dialog pops up
3. Click Cancel on the Project Selection dialog
4. Select Local/Save to Local Database. Verify that the current project is saved to the local database.

Testing Basic Remote Connection

1. Open HFAT
2. Select Database/Remote/Connect to Database
3. Verify that the Connection dialog pops up

Testing Basic Remote Save and Load

1. Open HFAT
2. Select Database/Remote/Connect to Database
3. Click Connect on the Connection dialog
4. If you are testing on a Windows platform, you will need to type in the name of a host with an IPME database.
5. Select Remote/Load from Local Database. If the project and system are marked with a "dirty dot" (and they should be if you have just opened HFAT), verify that a warning message about data loss pops up. Click OK on the warning dialog. Verify that the Project Selection dialog pops up
6. Click Cancel on the Project Selection dialog
7. Select Remote/Save to Remote Database. Verify that the current project is saved to the remote database.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

PR 274, 275

2.2.2 Project Elements

2.2.2.1 Toolbar Buttons

There are toolbar buttons for database functions (connect, load and save remote, load and save local). They should all function.

Testing Procedure

1. Open HFAT
2. Hover over each of the toolbar buttons and verify that the "flyby" help text appears. Additionally verify that the save to remote and load from remote buttons are initially disabled (gray).
3. Click the Connect button and verify the Connection dialog pops up.
4. Click Connect on the Connection dialog.
5. Verify the save to remote and load from remote buttons are now enabled (not gray).
6. Click the load from remote button. If the project and system are marked with a "dirty dot" (and they should be if you have just opened HFAT), verify that a warning mes-

sage about data loss pops up. Click OK on the warning dialog. Additionally, verify the load project dialog pops up.

7. Close the load project dialog.
8. Click the save to remote button and verify the project is saved to the remote database.
9. Click the load from local button and verify the load project dialog pops up.
10. Close the load project dialog.
11. Click the save to local button. If there is already a project with this name in the database (though there should not be if no previous local saves have been done), then a warning dialog indicating the existing data will be overwritten should pop up. Click OK on this dialog if it appears. Additionally, verify the project is saved to the local database.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.2.2 Rename Project

It should be possible to rename the HFAT project.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select the Rename Project menu item.
4. Type a new name in the dialog and click OK.
5. Verify the project is now displayed with the new name.
6. Save the project to the local database
7. Select Rename Project again.
8. Type a new name and click OK.
9. Verify the entry in the database, as well as the screen display are changed to the new name.

Test Platform

Windows 98

Pass/Fail

Fail

Related PR #s

PR 286

2.2.2.3 Add System

It should be possible to add a system to the HFAT project.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select the Add System menu item.
4. Verify there is now a "System2" in the project and that the project and this new system are both marked with a "dirty dot".

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.2.4 Add Crew Model

It should be possible to add a crew model to the HFAT project.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select the Add Model/Crew Model menu item.
4. Verify there is now a "CrewModel1" in the project and that the project and this new model are both marked with a "dirty dot".

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.2.5 Add Task Network Model

It should be possible to add a task network model to the HFAT project.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select the Add Model/Task Network Model menu item.
4. Verify there is now a "NetModel1" in the project project and this new model are both marked with a "dirty dot".

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.2.6 Document Manager

It should be possible to launch and use the Document Manager.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select the Document Manager menu item. Verify that the Document Manager pops up.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.2.7 Save to Local Database

It should be possible to save the project to the local database.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select the Save to Database/Local menu item.
4. Verify the project was saved to the local database. Additionally, verify that no items in the project are marked with a "dirty dot".

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.2.8 Save to Remote Database

It should be possible to save the project to the local database.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select the Save to Database/Remote menu item.
4. Verify the project was saved to the remote database. Additionally, verify that no items in the project are marked with a "dirty dot".

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.2.9 Export Project

It should be possible to export the HFAT_Project.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select the Export Project menu item.
4. Enter a name for the export file. Click Save.
5. Verify there is now an export file with that name. Additionally, verify that all the elements in the system are in the XML file <XML Spy?>

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.2.10 Copy Project

It should be possible to copy the HFAT project.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select the Copy Project menu item.
4. Click OK on the Copy Project dialog. Verify that you are not allowed to copy to the same name (if it exists in the database)
5. Change the name to a unique name and click OK.
6. Verify that there is now a project in the local database with the new name.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.2.11 Import Project

It should be possible to import the HFAT_Project.

Testing Procedure

1. Open HFAT
2. Click File | Import | Import Project.
3. Select the name of a project export file (extension *.PRX).
4. Verify the data imported correctly.

Test Platform

Windows 98, 2000

Pass/Fail

Pass

Related PR #s

None

2.2.2.12 Print Project To File

It should be possible to print the data contained in the current project.

Testing Procedure

1. Open HFAT.
2. Load or import a project containing systems with assigned task network and crew models, and containing unassigned task network and crew models.
3. Right click on the project element in the tree view.
4. Select the Print Project To File option.
5. Type or select a file name for the HTML output file using the File Chooser dialog that displays, then click the Save button.
6. Open the HTML output file in a web browser and verify that all the data from the project is present, as selected in the Print Options dialog.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.3 System Elements

2.2.3.1 Rename System

It should be possible to rename the systems in HFAT.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.

3. Right click on the "System1" entry.
4. Select Rename System.
5. Type a new name in the dialog and click OK.
6. Verify the system is now displayed with the new name.
7. Save the system to the local database
8. Select Rename System again.
9. Type a new name and click OK.
10. Verify the entry in the database, as well as the screen display are changed to the new name.

Test Platform

Windows 98, 2000

Pass/Fail

Pass

Related PR #s

PR 288

2.2.3.2 Save to Local Database

It should be possible to save the system to the local database.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select Save to Database/Local. Verify that the system is saved to the local database. Additionally, verify no items in the system (including the system itself) are marked with a "dirty dot".

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.3.3 Save to Remote Database

It should be possible to save the system to the remote database.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select Save to Database/Remote. Verify that the system is saved to the remote database.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.3.4 Export System

It should be possible to export the system to an XML file.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select Export System.
5. Select a name to save the system data to. Verify the xml file containing the system was created.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.3.5 Copy System

It should be possible to copy the system within the local database.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select Copy System.
5. Verify that a new system named "System2" is displayed in the project and has been added to the local database.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

PR 289

2.2.3.6 Delete System

It should be possible to delete the system from the local database.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select Delete System.
5. Verify the system has been removed from the project display.
6. Right click on the "HFAT_Project" entry.
7. Select Add System.
8. Save the project.
9. Open the project.
10. Right click on the "System1" entry.
11. Select Delete System
12. Verify the system has been removed from the project display and deleted from the database.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.3.7 Import System

It should be possible to import a system.

Testing Procedure

1. Open HFAT
2. Click File | Import | Import System
3. Select a system export file to import (file with extension *.SYX).
4. Confirm that the imported system contains all data in the export file.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.3.8 Print System To File

It should be possible to print the data contained in the selected system.

Testing Procedure

1. Open HFAT.
2. Load or import a system with assigned task network and crew models.
3. Right click on the system and select Print System To File.
4. Type or pick a name for the HTML output file and click the Save button.
5. Open the HTML output file in a web browser and verify that all the data from the system is present, as selected in the Print Options dialog.

Test Platform

Windows 98

Pass/Fail

Pass

Related PR #s

None

2.2.4 Crew Model Elements

2.2.4.1 Rename Crew Model

It should be possible to rename the crew model in HFAT.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Crew Model entry.
5. Open the "System1" entry
6. Right click on the "CrewModel1" entry.
7. Select Rename Crew Model.
8. Type a new name into the dialog that pops up and Click OK. Verify that the crew model is displayed with the new name.
9. Save the model to the local database
10. Select Rename Crew Model again.
11. Type a new name and click OK.
12. Verify the entry in the database, as well as the screen display is changed to the new name.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

PR 286

2.2.4.2 Save to Local Database

It should be possible to save the crew model to the local database.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Crew Model entry.
5. Open the "System1" entry
6. Right click on the "CrewModel1" entry.
7. Select Save to Database/Local. Verify that the crew model was saved to the local database. Additionally, verify the crew model is not marked with a "dirty dot".

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.4.3 Save to Remote Database

It should be possible to save the crew model to the remote database.

Testing Procedure

1. Open HFAT
2. Click on the Connect button, and click Connect on the connection dialog.
3. Open the "HFAT_Project" entry.
4. Right click on the "System1" entry.
5. Select the Add Model/Crew Model entry.
6. Open the "System1" entry
7. Right click on the "CrewModel1" entry.
8. Select Save to Database/Remote. Verify that the crew model was saved to the remote database.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.4.4 Export Crew Model

It should be possible to save the crew model as an XML file.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Crew Model entry.
5. Open the "System1" entry
6. Right click on the "CrewModel1" entry.
7. Select Export Model.
8. Select a name to save the crew model xml file as.
9. Click Save. Verify that the XML file was created.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.4.5 Import Crew Model

It should be possible to import the crew model from an XML file.

Testing Procedure

1. Open HFAT
2. Select File | Import | Import Crew Model.
3. Select a crew model file to import.
4. Enter a new name for the crew model.
5. Confirm the crew model data was imported successfully.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.4.6 Assign to System

It should be possible to assign a crew model to a system.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select Add System.
4. Open the "HFAT_Project" entry.
5. Right click on the "System1" entry.

6. Select the Add Model/Crew Model entry.
7. Open the "System1" entry
8. Right click on the "CrewModel1" entry.
9. Select Assign to System.
10. In the system selection dialog, select System2.
11. Click OK. Verify the crew model is now assigned to System2 and not assigned to System1.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.4.7 Unassign Model

It should be possible to un-assign the crew model in HFAT.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Crew Model entry.
5. Open the "System1" entry
6. Right click on the "CrewModel1" entry.
7. Select Unassign Model.
8. Verify that the crew model is now displayed at the project level, and not displayed within the System1.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.4.8 Copy Crew Model

It should be possible to make a copy of the crew model in the local database.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.

4. Select the Add Model/Crew Model entry.
5. Open the "System1" entry
6. Right click on the "CrewModel1" entry.
7. Select Copy Model
8. Verify that a new crew model named "CrewModel2" is displayed in the project with the new name.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

PR 289

2.2.4.9 Delete Crew Model

It should be possible to delete the crew model in HFAT.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Crew Model entry.
5. Open the "System1" entry
6. Right click on the "CrewModel1" entry.
7. Select Delete Model. Verify that crew model is removed from the display.
8. Right click on the "System1" entry.
9. Select the Add Model/Crew Model entry.
10. Save the project.
11. Open the "System1" entry
12. Right click on the "CrewModel1" entry.
13. Select Delete Model. Verify that crew model is removed from the display and the database.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

PR 281

2.2.4.10 Print Model To File

It should be possible to print the data contained in the selected crew model.

Testing Procedure

1. Open HFAT.
2. Load or import a Crew Model containing characteristic and attribute data.
3. Right click on the crew model in the tree view.
4. Select Print Model To File.
5. Type or pick a name for the HTML output file and click the Save button.
6. Open the HTML output file in a web browser and verify that all the data from the model is present, as selected in the Print Options dialog, on the Crew tab.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.5 Task Network Model Elements

2.2.5.1 Rename Task Network Model

It should be possible to rename the task network model in HFAT.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Task Network Model entry.
5. Open the "System1" entry
6. Right click on the "NetModel1" entry.
7. Select Rename Net Model.
8. Type a new name into the dialog that pops up and Click OK. Verify that the task network model is displayed with the new name.
9. Save the model to the local database
10. Select Rename Task Network Model again.
11. Type a new name and click OK.
12. Verify the entry in the database, as well as the screen display is changed to the new name.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

PR 288

2.2.5.2 Save to Local Database

It should be possible to save the task network model to the local database.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Task Network Model entry.
5. Open the "System1" entry
6. Right click on the "NetModel1" entry.
7. Select Save to Database/Local. Verify that the task network model was saved to the local database. Additionally, verify the model is not marked with "dirty dot".

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.5.3 Save to Remote Database

It should be possible to save the task network model to the remote database.

Testing Procedure

1. Open HFAT
2. Click the Connection button, then click Connect on the Connection dialog
3. Open the "HFAT_Project" entry.
4. Right click on the "System1" entry.
5. Select the Add Model/Task Network Model entry.
6. Open the "System1" entry
7. Right click on the "NetModel1" entry.
8. Select Save to Database/Remote. Verify that the task network model was saved to the remote database.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.5.4 Export Task Network Model

It should be possible to save the task network model as an XML file.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Task Network Model entry.
5. Open the "System1" entry
6. Right click on the "NetModel1" entry.
7. Select Export Model.
8. Select a name to save the task network model xml file as.
9. Click Save. Verify that the XML file was created.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.5.5 Import Task Network Model

It should be possible to import a task network model from an XML file.

Testing Procedure

1. Open HFAT
2. Select File | Import | Import Task Network Model.
3. Select a task network XML file to import.
4. Select a new name for the model.
5. Confirm the data was imported successfully.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.5.6 Assign to System

It should be possible to assign a task network model to a system.

Testing Procedure

1. Open HFAT
2. Right click on the "HFAT_Project" entry.
3. Select Add System.

4. Open the "HFAT_Project" entry
5. Right click on the "System1" entry.
6. Select the Add Model/Task Network Model entry.
7. Open the "System1" entry
8. Right click on the "NetModel1" entry.
9. Select Assign to System.
10. In the system selection dialog, select System2.
11. Click OK. Verify the task network model is now assigned to System2 and not assigned to System1.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.5.7 Unassign Model

It should be possible to un-assign the task network model in HFAT.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/task network Model entry.
5. Open the "System1" entry
6. Right click on the "NetModel1" entry.
7. Select Unassign Model.
8. Verify that the task network model is now displayed at the project level, and not displayed within the System1.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.2.5.8 Copy Task Network Model

It should be possible to make a copy of the task network model in the local database.

Testing Procedure

1. Open HFAT

2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Task Network Model entry.
5. Open the "System1" entry
6. Right click on the "NetModel1" entry.
7. Select Copy Model
8. Verify that a new task network model is displayed in the project with the name "NetModel2".

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

PR 289

2.2.5.9 Delete Task Network Model

It should be possible to delete the task network model in HFAT.

Testing Procedure

1. Open HFAT
2. Open the "HFAT_Project" entry.
3. Right click on the "System1" entry.
4. Select the Add Model/Task Network Model entry.
5. Save the project
6. Open the "System1" entry
7. Right click on the "NetModel1" entry.
8. Select Delete Model. Verify that task network model is removed from the display and from the database.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

PR 281

2.2.5.10 Print Model To File

It should be possible to print the data contained in the selected task network model.

Testing Procedure

1. Open HFAT.
2. Load or import a task network model containing task, network, and task notes data.

3. Right click on the task network model in the tree view.
4. Select Print Model To File.
5. Type or pick a name for the HTML output file and click the Save button.
6. Open the HTML output file in a web browser and verify that all the data from the model is present, as selected in the Print Options dialog, on the Task Network tab.

Test Platform

Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.3 Database Versioning

2.3.1 Version Database Creation

If HFAT is run on a computer without a version database, HFAT should create a version database.

Testing Procedure

1. Install HFAT on a machine that has not previously run HFAT or IPME.
2. Start HFAT.
3. HFAT will prompt for the root MySQL password. Enter the password.
4. The version database is created. Verify this at a command line prompt:

   mysql –uroot –p<password>
   show databases;

   The database ipme_version_db should be included in the list.

Test Platform

RedHat Linux 7.2, Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.3.2 HFAT Version Table Addition

If HFAT is run on a Linux machine that has had a previous version of IPME installed, there is no version table for HFAT. HFAT will create the version table.

Testing Procedure

1. Install HFAT on a Linux machine that has not previously run HFAT.

2. Start HFAT.
3. HFAT will prompt for the root MySQL password. Enter the password.
4. The table hfatdb_version is created. Verify this at a command line prompt:
   mysql –uroot –p<password>
   use ipme_version_db;
   show tables;

Test Platform

RedHat Linux 7.2

Pass/Fail

Pass

Related PR #s

None

2.3.3 HFAT Database Creation

If HFAT does not find the appropriate database for the application, it will create the database.

Testing Procedure

1. Modify the HFAT_DATABASE_VERSION global variable in Globals.java. Change the version to a different number (2.5).
2. Recompile HFAT.
3. Run HFAT. HFAT will prompt for the MySQL root password to create the HFAT database.
4. Confirm that the database was created:
   mysql –uroot –p<password>
   show databases;

   The database ipme_version_db should be included in the list.

Test Platform

RedHat Linux 7.2, Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.3.4 HFAT Database Access

HFAT will access the correct HFAT database depending on the database version it uses.

Testing Procedure

1. Run the current version of HFAT. This version uses database version 2.4.7.
2. Run the version of HFAT you modified in the previous test. That version uses database version 2.5.

3. Each running HFAT should access the correct database. Confirm this by saving data to the database and looking at the data in MySQL.

Test Platform

RedHat Linux 7.2, Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.3.5 Prompt for MySQL Root Password Occurs Only Once

HFAT should prompt the user to enter the MySQL root password only once.

Testing Procedure

1. Ensure that both the version database and HFAT database do not exist.
2. Run the current version of HFAT.
3. HFAT will prompt for the root password for the version database, and create the HFAT database without further prompts.
4. Remove the HFAT database and the hawkdb_version table from the version database.
5. Run HFAT again.
6. HFAT will prompt for the root password to update the version database, and create the HFAT database without further prompts.

Test Platform

RedHat Linux 7.2, Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.3.6 Cancel from MySQL Root Password Prompt Dialogue Exits HFAT

HFAT cannot successfully run without updating the version database and creating a local HFAT database. If the user cancels or closes the MySQL root password prompt dialogue, HFAT will exit.

Testing Procedure

1. Delete the current HFAT database using DBAT.
2. Run the current version of HFAT.
3. At the MySQL root password prompt dialogue, click Cancel.
4. HFAT will show a dialogue informing the user that it must exit. Click OK at this dialogue, and HFAT closes.
5. Delete the current HFAT database using DBAT.
6. Run HFAT again.

7. At the MySQL root password prompt, click the X button.
8. HFAT will show a dialogue informing the user that it must exit. Click OK at this dialogue, and HFAT closes.

Test Platform

RedHat Linux 7.2, Windows 2000

Pass/Fail

Pass

Related PR #s

None

2.3.7 Prompt the User If the HFAT Database Exists

This condition will rarely occur because the user must modify the MySQL database directly. If the HFAT database exists, and does not have an entry in the version database, HFAT will ask the user if they wish to replace the existing database. Similarly, if the HFAT database exists, and there is no version database, HFAT will create the version database and check for the existence of the HFAT database. In both cases HFAT will add the appropriate version information to the hawkdb_version table. HFAT will access the correct HFAT database depending on the database version it uses.

Testing Procedure

1. Remove the HFAT database entry from the hawkdb_version table. (DELETE from hawkdb_version where version='2_4_7';)
2. Run the current version of HFAT. This version uses database version 2.4.7.
3. HFAT will prompt the user to replace the existing database. By selecting No, the old database will be used. By selecting Yes, HFAT will prompt for the MySQL root password to create a new HFAT database.
4. Exit from HFAT.
5. Remove the database ipme_version_db (DROP DATABASE ipme_version_db;).
6. Run the current version of HFAT again.
7. HFAT will prompt the user for the MySQL root password to create the version database. Enter the MySQL root password.
8. HFAT will then prompt the user to replace the existing database. By selecting No, the old database will be used. By selecting Yes, HFAT will then create the new database.

Test Platform

RedHat Linux 7.2, Windows 2000

Pass/Fail

Pass

Related PR #s

None

3 Features Not To Be Tested

Only the functionality discussed in this document was tested. Any previous existing functionality was not tested.

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14. ABSTRACT

(U) This report describes the software development and testing completed for the Human Factors Analysis Tools (HFAT). This development increased the capabilities of HFAT to support human factors engineering information collection and modelling. The HFAT user's guide should be consulted for a complete description of the HFAT capabilities as this report only describes current contract work done.

(U) Le présent rapport décrit le processus d'élaboration et d'essai du logiciel d'analyse des facteurs humains Human Factors Analysis Tools (HFAT). Ce travail a permis d'accroître la capacité du logiciel HFAT en vue de la collecte de données ergonomiques et de la modélisation. Pour une description complète de la capacité du logiciel HEAT, il faudra consulter le guide de l'usager, puisque ce rapport ne décrit que le travail réalisé dans le cadre du présent contrat.

15. KEYWORDS, DESCRIPTORS or IDENTIFIERS

(U) human factors engineering; IPME; human performance modelling